

ANDREA BEATTY RINKER  
Director



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

M E M O R A N D U M

June 18, 1986

To: Carl Neuchterlein  
Through: Bill Yake <sup>BY</sup>  
From: Art Johnson <sup>aj</sup> and Dale Norton <sup>D.N.</sup>  
Subject: Data Report for Samples Collected at Port of Pasco,  
September 9-10, 1985

INTRODUCTION

Attached are summary and raw data data tables for the water, sediment, and fish samples Dale and I collected with you and Larry Peterson at the Port of Pasco on September 9-10, 1985. The objectives of the survey were to document petroleum contamination, screen for the presence of toxicants other than petroleum, and evaluate the extent of contamination in Juvenile Pond which receives site discharges.

As we discussed earlier, there were several serious problems associated with the analyses done for this survey. These were as follows:

- o Holding times were exceeded for volatiles, acid/base-neutrals, and pesticides in water.
- o Holding times were exceeded for pesticides/PCBs in all media.
- o Blanks for analysis of metals in water were contaminated with copper, zinc, and nickel.
- o Two of the three sediment samples collected were discarded before metals analyses were done.

As a result, most of the priority pollutant data are of questionable accuracy. In light of this, our report will be limited to a brief description of the survey, some general observations on the results, and recommendations for follow-up work.

#### METHODS

Figures 1 and 2 show where samples were collected at the Port of Pasco and vicinity.

Sediment was collected September 9 near each of the two inlets to Juvenile Pond (No. 8094-96). Samples of the top 2 cm layer were taken by Ponar grab. Replicates were collected at the station near the east inlet. Samples were homogenized by stirring with stainless steel spoons in stainless steel beakers.

Ground water, surface water, and fish tissue samples were collected September 10. Ground water samples were from the monitoring well inside the Columbia Marine Lines office yard - identified as Well No. 1 in Figure 2 of Russell (1973). Sampling was done with a teflon bailer; the well was not purged. The distance from the top of the well casing to the surface of the petroleum overlaying the ground water was 6.5 feet. The petroleum layer was 7.7 inches thick. The water fraction (No. 8087) was retained for analysis except for one sample of petroleum for hydrocarbon matching with other surface water samples. The thickness of the petroleum layer in nearby Well No. 2 (Russell, 1973) was also measured and was 4.8 inches.

Surface water samples were grabs collected at the following locations:

- o Manhole No. 2 (No. 8086).
- o Immediately below the oil/water separator on the east inlet to Juvenile Pond (No. 8088/89).
- o West inlet to Juvenile Pond at the first upstream culvert (No. 8090).
- o Inlet structure of the pump station on Juvenile Pond discharging to the Columbia River (No. 8091).

Flows were gaged at the east and west inlets to Juvenile Pond with a Marsh-McBirney magnetic flow meter and top-setting rod. Flow data were not available for the pond discharge to the Columbia River. The pumps are rated at 14,800 gpm and work intermittently off a float switch.

Carp (Cyprinus carpio), were obtained from Juvenile Pond by electroshocking. Three specimens were taken for muscle tissue analysis (composite sample; No. 8097). The range in total length was 32.5-44.5 cm; weights ranged from 528-1,204 grams.

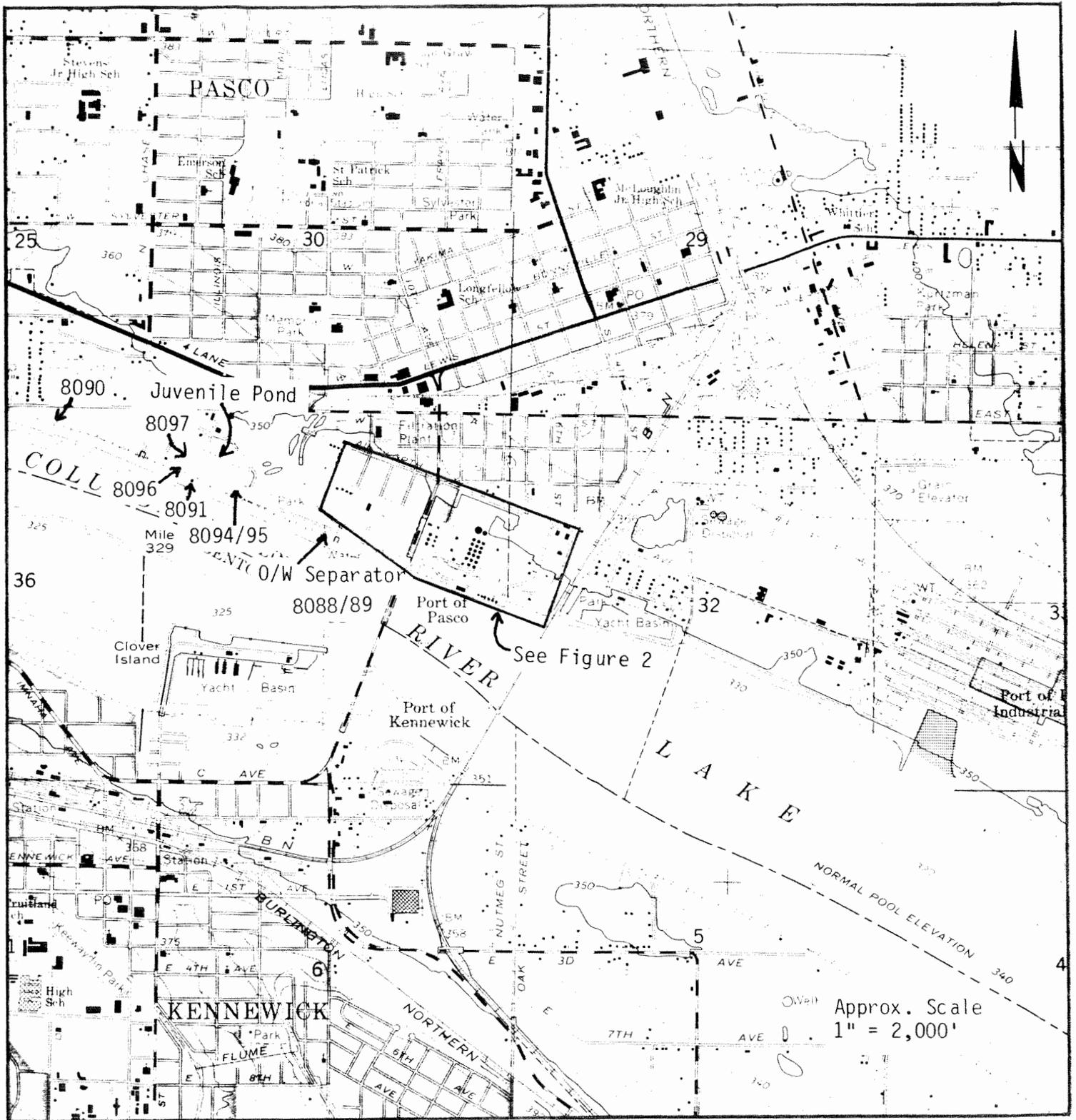


Figure 1. Locations of water, sediment, and fish samples collected by Ecology at Port of Pasco and vicinity on September 9-10, 1985.

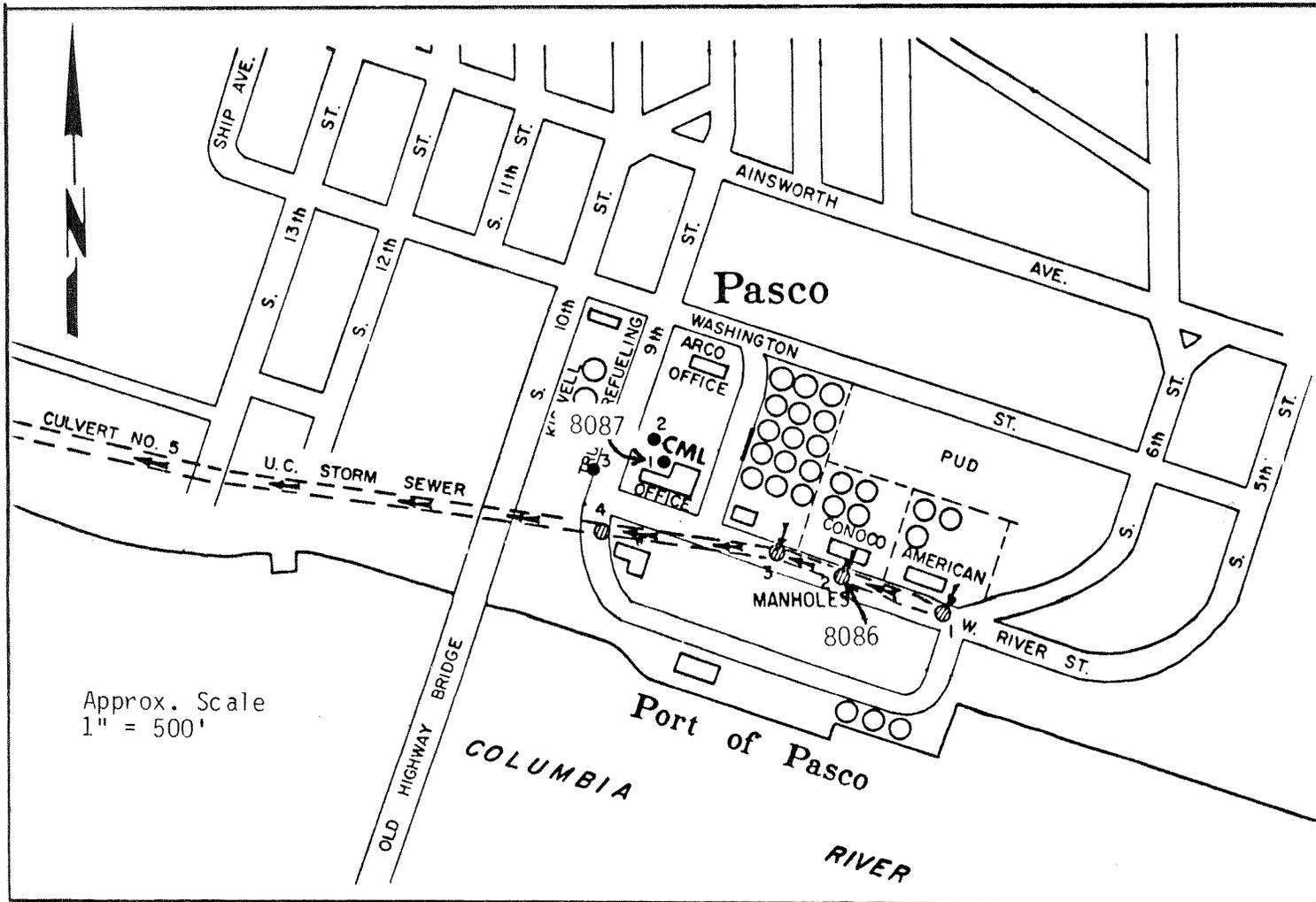


Figure 2. Locations of water samples collected by Ecology at Port of Pasco on September 10, 1985.

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Sample bottles for organics and metals were priority pollutant cleaned by I-Chem Research, Inc., Hayward, CA. The teflon bailer, ponar grab, spoons and beakers, and the aluminum foil used to wrap the fish samples were cleaned by rinsing with hydrochloric acid and nanograde acetone. All samples were placed on ice immediately after collection.

Analysis was done by the Ecology/EPA Manchester, WA, Laboratory.

#### RESULTS

Table 1 summarizes the results of priority pollutant and conventional analyses- note the data qualifiers.

Petroleum contamination of ground water is shown by the aromatic hydrocarbons detected in the water fraction from Well No. 1. Tetra-ethyl lead was also detected. The sampling technique mixed the petroleum layer with the ground water, so these results are indicative of the types of compounds potentially present in the ground water. Pesticides and PCBs were not detected in ground water. The elevated lead, mercury, and arsenic concentrations measured also probably are due to petroleum.

Drainage water upstream of the site of petroleum contamination, represented by the sample at Manhole No. 2, had no reported petroleum compounds, other organic priority pollutants, or cyanide. Metals concentrations appeared low, but the copper, zinc, and nickel data suffer from blank contamination. Manchester has had a long-standing quality assurance problem for these metals.

The drainage downstream of the industrial park immediately below the oil/water separator was reported to have traces of petroleum (toluene, ethylbenzene, xylenes), chlorinated solvents (1,1-dichloroethane, 1,1,1-trichloroethane, tetrachloroethene), and the fumigant 1,2-dichloropropane. 1,2-dichloropropane is a constituent of Telone II (D-D soil fumigant), one of the pesticides handled by Columbia Marine Lines. EPA has a draft recommended maximum contaminant level (RMCL) of 6 µg/L for 1,2-dichloropropane in ground water. Results from analysis of replicable samples taken at this location were in good agreement for the above compounds.

Tetrachloroethene and ethylbenzene were reported present at their detection limit in the west inlet to Juvenile Pond. Although a slight petroleum sheen was observed on the surface of Juvenile Pond, only tetrachloroethene was detected in the pond discharge to the Columbia River.

None of the concentrations reported for the above compounds in surface waters exceeded EPA water quality criteria. However, actual concentrations may have been underestimated because holding times were exceeded. Chlorinated pesticides, PCBs, and cyanide analysis of surface waters revealed no additional compounds. Given the problems that exist with the metals analysis, there was no evidence of unusually high concentrations.

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Toluene, xylenes, trichloroethene, 2-hexanone and 4-methyl-2-pentanone were present at or near their detection limits in sediment from the east end of Juvenile Pond. 2-hexanone and 4-methyl-2-pentanone are ketones. Hexadecanoic acid (a natural compound) and sulfur were also tentatively identified. Trichloroethene, tetrachloroethene, and pentachlorophenol were reported in sediment from the west end of Juvenile Pond. Pentachlorophenol is not often detected in sediment, apparently due to its solubility and relative rapid degradation. The estimated concentration of 860 ug/Kg in the west end sample appears high. Metals concentrations in the west end sediment are not unusual. Based on visual observations, the sediments did not appear to be contaminated with petroleum.

The acid/base-neutrals analysis of carp muscle did not detect any compounds. The detection limits achieved for acid/base-neutrals in both fish and sediment were high. Substantial contamination would have had to be present to be detected.

Pesticides/PCB analysis of carp muscle detected P,P'-DDE at 35 ug/kg and PCB-1254 at 300 ug/kg. FDA action levels for these compounds are 5,000 ug/kg (wet) t-DDT (DDT+DDE+DDD) and 2,000 ug/kg (wet) PCBs. Cadmium, lead, and mercury concentrations in carp muscle were also well below the FDA action levels of 500 ug/kg for cadmium, 7,000 ug/kg for lead, and 1,000 ug/kg for mercury.

The hydrocarbon matching (see attachments) of the petroleum and water from Well No. 2 and each of the surface water samples indicated the petroleum was a mixture of hydrocarbons from different sources. The level of contamination in the surface waters was not sufficient to determine if a match existed.

Analysis of the Juvenile Pond discharge to the Columbia River (see attachments) to determine compliance with state water quality standards showed that temperature, dissolved oxygen, pH, and turbidity were within Class AA standards. Bacterial contamination was indicated by counts of 440 and 340 colonies/100 mL. A high level of nitrate, 13.0 mg/L, was measured.

#### RECOMMENDATIONS

The substantial pool of petroleum overlying the ground water at the Port of Pasco appeared to be causing only trace contamination of downstream surface waters. There is, of course, a clear and long-standing need to recover the spilled product. Based on the abundant population of carp and suckers in Juvenile Pond, there was no obvious evidence of an acute toxicity problem.

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Two potential problem chemicals, 1,2-dichloropropane and pentachlorophenol, were identified. Because of the questionable accuracy of the water analyses, water from the east and west inlets to Juvenile Pond should be resampled and analyzed for volatiles and acid/base-neutrals. The extent of pentachlorophenol contamination in Juvenile Pond sediments should be evaluated through collection of several additional samples for acid compounds.

#### REFERENCES

Russell, R.H. 1973 Geo-hydrologic evaluation of Pacific Inland Navigation Company tank farm oil spill problem, Port of Pasco, Washington, Washington State Department of Ecology

AJ:av  
OP1/86/060316A

Attachments

Table 1. Results of Ecology/EPA Manchester Laboratory Analyses of Port of Pasco Samples Collected by WQIS and ERO on September 9-10, 1985 (Note data qualifiers)

Matrix Sample Location Sample Number	WATER						SEDIMENT			TISSUE
	Sewer at Manhole No. 2 #8086	Well No. 2 at Columbia Marine Lines #8087	Drain below O/W Separator		West Inlet to Juvenile Pond #8090	Juvenile Pond Discharge to Columbia R. #8091	East End of Juvenile Pond		West End of Juvenile Pond #8096	Carp Muscle #8097
	#8086	#8087	#8088	#8089	#8090	#8091	#8094	#8095	#8096	#8097
flow (cfs)	-	-	0.37	-	9.3	-	-	-	-	-
temp. (°C)	16.2	-	16.2	-	17.1	17.4	-	-	-	-
pH	6.5	-	6.5	-	6.4	6.7	-	-	-	-
specific cond. (umhos/cm)	606	2,120	675	672	684	713	-	-	-	-
tot. hardness (mg/L)	-	-	-	-	-	280	-	-	-	-
tot. susp. solids (mg/L)	5	180	11	4	7	7	-	-	-	-
oil & grease (mg/l)	1 U	130	1.4	1.1	1 U	2.1	0.3	0.2	0.2	-
% solids	-	-	-	-	-	-	-	31	2	22
% ash	-	-	-	-	-	-	-	93	91	-
<u>Volatiles (ppb)</u>										
1,1-dichloroethane	5 U+	2,500 U+	2.5 J+	2.7 J+	5 U+	5 U+	35 U	38 U	43 U	-
1,1,1-trichloroethane	5 U+	2,500 U+	27 +	31 +	5 U+	5 U+	35 U	38 U	43 U	-
1,2-dichloropropane	5 U+	2,500 U+	39 +	47 +	5 U+	5 U+	35 U	38 U	43 U	-
tetrachloroethene	5 U+	2,500 U+	11 +	13 +	1 UJ+	3.7 UJ+	35 U	38 U	5.7 J	-
toluene	5 U+	19,000 +	1 J+	1 J+	5 U+	5 U+	1 J	38 U	43 U	-
ethylbenzene	5 U+	23,000 +	1 J+	1 J+	1 J+	5 U+	35 U	38 U	43 U	-
total xylenes	5 U+	370,000 +	16 +	13 +	5 U+	5 U+	5 J	38 U	43 U	-
methylethylbenzene + isomers	NI +	250,000 +	NI +	NI +	NI +	NI +	NI	NI	NI	-
trimethylbenzene + isomers	NI +	420,000 +	NI +	NI +	NI +	NI +	NI	NI	NI	-
methylpropylbenzene + isomers	NI +	140,000 +	NI +	NI +	NI +	NI +	NI	NI	NI	-
dimethylethylbenzene + isomers	NI +	110,000 +	NI +	NI +	NI +	NI +	NI	NI	NI	-
tetramethylbenzene + isomers	NI +	66,000 +	NI +	NI +	NI +	NI +	NI	NI	NI	-
2-hexanone	10 U+	5,000 U+	10 U+	10 U+	10 U+	10 U+	70 U	100	86 U	-
4-methyl-2-pentanone	10 U+	5,000 U+	10 U+	10 U+	10 U+	10 U+	70 U	59	86 U	-
trichloroethene	5 U+	2,500 U+	5 U+	5 U+	5 U+	5 U+	35 U	44 UJ	3 UJ	-
<u>Acid/Base-Neutrals (ppb)</u>										
naphthalene	2 U+	28,000 +	2 U+	2 U+	2 U+	2 U+	1,400 U	1,400 U	1,600 U	400 U
2-methylnaphthalene	2 U+	35,000 +	2 U+	2 U+	2 U+	2 U+	1,400 U	1,400 U	1,600 U	400 U
2,3-dimethylnaphthalene	NI +	6,900 J+	NI +	NI +	NI +	NI +	NI	NI	NI	NI
acenaphthene	2 U+	300 J+	2 U+	2 U+	2 U+	2 U+	1,400 U	1,400 U	1,600 U	400 U
phenanthrene	2 U+	1,500 J+	2 U+	2 U+	2 U+	2 U+	1,400 U	1,400 U	1,600 U	400 U
2,5-dimethylphenanthrene	NI +	1,500 J+	NI +	NI +	NI +	NI +	NI	NI	NI	NI
2-methylanthracene	NI +	3,700 J+	NI +	NI +	NI +	NI +	NI	NI	NI	NI
tetraethyl lead	NI +	570 J+	NI +	NI +	NI +	NI +	NI	NI	NI	NI
pentachlorophenol	2 U+	3,000 U+	2 U+	2 U+	2 U+	2 U+	1,400 U	1,400 U	860 J	400 U
hexadecanoic acid	NI +	NI +	NI +	NI +	NI +	NI +	130,000 J	present	NI	NI
sulfur	NI +	NI +	NI +	NI +	NI +	NI +	36,000 J	NI	NI	NI
<u>Pesticides/PCBs (ppb)</u>										
P,P'-DDE	0.002 U+	0.002 U+	0.002 U+	0.002 U+	0.002 U+	0.002 U+	5 U+	5 U+	5 U+	35 +
PCB-1254	0.04 U+	0.04 U+	0.04 U+	0.04 U+	0.04 U+	0.04 U+	60 U+	60 U+	60 U+	300 +
<u>Metals (ppb)</u>										
copper	68 *	68 *	66 *	60 *	68 *	45 *	NA	NA	89,400	-
zinc	21 *	6 *	50 *	47 *	21 *	15 *	NA	NA	88,300	-
nickel	24 *	5 *	38 *	1 U*	30 *	10 *	NA	NA	-	-
chromium	1 U	1 U	1 U	15	1 U	1 U	NA	NA	28,000	-
cadmium	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	190	3 U
lead	13	24.6	1 U	1 U	1 U	6 U	NA	NA	50,400	162
mercury	0.05 U	0.90	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	8	38
arsenic	4	107	8	2	8	8	NA	NA	4,100	-
<u>Miscellaneous (ppb)</u>										
cyanide	5 U	220	5 U	5 U	5 U	5 U	-	-	-	-

U = Not detected at detection limit shown  
 J = Estimated concentration  
 + = Holding time exceeded in analysis  
 - = Analysis not requested  
 \* = Blank contamination  
 NI = Not identified  
 NA = Not analyzed (lab lost sample)



DATA SUMMARY

SOURCE Pasco Industrial Park

DATE COLLECTED 9/9-10/85

COLLECTED BY AJ/DN

Sample (Log) Number	37	8086	8087	8088	8089	8090	8091	8091 <sup>2</sup>	8092	8093	8094
Station:		Manhak 2	W. 1	O-W Sept.	Rep	West Drain	Pond Disch.	Pond Disch.	Transp. Blank	Transp. Blank	East End Pond
pH (units)			7.1		7.4	7.9	7.8				
Turbidity (NTU)							1				
Sp. Conductivity (umhos/cm)		606	2120	675	672	684	713				
COD											
BOD (5 day)											
Fecal Coliform (Col./100 ml)							440*	340*			
NO3-N							13.0				
NO2-N							<.01				
NH3-N							.88				
T.Kjeldahl-N											
O-P04-P							.06				
Total Phos.-P							.10				
Total Solids - %											33
Total Non Vol. Solids % ash											93
Total Suspended Solids		5	180	11	4	7	7				
Total Non Vol. Sus. Solids											
Total Hardness <sup>as</sup> CaCO <sub>3</sub>							280				
D.O (mg/L; field)							10.5				
" " "							10.3				
pH (units; field)							6.7				
" " "							6.7				
Temperature (°; field)							17.4				

NOTE: All results are in mg/L(ppm) unless otherwise specified. ND is "None Detected"

"<" is "Less Than" and ">" is "Greater Than"

\* Many background organisms

Pam Conroy





STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

MEMORANDUM  
February 21, 1986

TO: Art Johnson

FROM: Dick Huntamer, Chemist *DH*

SUBJECT: Organic Analyses of Pasco Industrial  
Park Samples, Pasco, Washington

Twelve samples, collected on September 9-10, 1985, were received at the Manchester Environmental Laboratory on September 11, 1985, for analyses. The results of the volatile organic analyses on the three soil samples which had to be re-extracted due to poor surrogate recoveries are attached.

Lab Number

378086	Manhole # 2	Water
378087	Well # 1	Water
378088	Ind. Park Drain O/W Separator	Water
378089	Ind. Park Replicate	Water
378090	West Drain to Juvenile Pond	Water
378091	Pond Discharge to Columbia River	Water
378092	Transfer Blank	Water
378093	Transport Blank	Water
378094	Juvenile Pond East End	Soil
378095	Juvenile Pond East End	Soil
378096	Juvenile Pond West End	Soil
379097	Juvenile Pond	Fish Tissue
378098	Well # 1	

DH/cm  
Attachment

PROJECT CODE GCORIE - 412

PROJECT Raso Industri Park

LABORATORY Manchester

COMPILED BY: SV Page

DATE: 12-4-85

REVIEWED BY: JMB

DATE: 12-4-85

SAMPLE # :	37- 8086	37- 8087	37- 8088	37- 8089	37- 8090	37- 8091	37- 8092	37- 8093
UNITS :	MC/L							↓
% SOLIDS :	—	—	—	—	—	—	—	—
Date Analyzed :	11/24/85				12/2/85			↓
1. chloromethane	10u	700u	10u	10u	10u	10u	10u	10u
2. bromomethane		5000u						
3. vinyl chloride								
4. chloroethane	↓		↓	↓	↓	↓	↓	↓
5. methylene chloride	2.5uJ	1.00uJ	1.7uJ	2.2uJ	1.3uJ	1.1uJ	6.5uJ	1.2uJ
6. acetone	3.3uJ	1.3E4uJ	3.7uJ	3.5uJ	6.7uJ	5.4uJ	10uJ	4.1uJ
7. carbon disulfide	5u	2500u	5u	5u	5u	5u	5u	5u
8. 1,1-dichloroethene			↓	↓				
9. 1,1-dichloroethane			2.5J	2.7J				
10a trans-1,2-dichloroethene			5u	5u				
10b cis-1,2-dichloroethene								
11. chloroform								
12. 1,2-dichloroethane	↓	↓	↓	↓	↓	↓	↓	↓
13. 2-butanone	4.3uJ	3.0E4uJ	4.4uJ	5.0uJ	3.8uJ	4.0uJ	4.0uJ	4.2uJ
14. 1,1,1-trichloroethane	5u	2500u	27	31	5u	5u	5u	5u
15. carbon tetrachloride	↓	↓	5u	5u	↓	↓	↓	↓
16. vinyl acetate	10u	5000u	10u	10u	10u	10u	10u	10u
17. bromodichloromethane	5u	2500u	5u	5u	5u	5u	5u	5u
18. 1,1,2,2-tetrachloroethane			↓	↓				
19. 1,2-dichloropropane			39	47				
20. trans-1,3-dichloropropene	↓	↓	5u	5u	↓	↓	↓	↓

## VOLATILES (Continued)

PROJECT Passco Includo rackCOMPILED BY: SV RifeDATE: 12-4-85LABORATORY ManchesterREVIEWED BY: JMBDATE: 12-4-85

SAMPLE # :	37- 8092	37- 8087	37- 8088	37- 8089	37- 8090	37- 8091	37- 8092	37- 8093	
UNITS :	ug/l								
21. trichloroethene	5u	2500u	5u	5u	5u	5u	5u	5u	
22. dibromochloromethane									
23. 1,1,2-trichloroethane									
24. benzene									
25. cis-1,3-dichloropropene	↓	↓	↓	↓	↓	↓	↓	↓	
26. 2-chloroethylvinyl ether	10u	5000u	10u	10u	10u	10u	10u	10u	
27. bromoform	5u	2500u	5u	5u	5u	5u	5u	5u	
28. 2-hexanone	10u	5000u	10u	10u	10u	10u	10u	10u	
29. 4-methyl-2-pentanone	↓	↓	↓	↓	↓	↓	↓	↓	
30. tetrachloroethene	5u	2500u	11	13	14J	3.70J	14J	14J	
31. toluene		1.9E4	1J	1J	5u	5u	5u	5u	
32. chlorobenzene		2500u	5u	5u	↓				
33. ethylbenzene		2.3E4	1J	1J	1J				
34. styrene		2500u	5u	5u	5u				
35. total xylenes	↓	3.7E5	16	13	↓	↓	↓	↓	

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration dilution actions (This is not necessarily the instrument detection limit). The footnotes should read U: Compound was analyzed for for but not detected. The number is the minimum attainable detection limit for the sample.

J Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. (e.g. 10J)

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.



ANDREA BEATTY RINKER  
Director



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

M E M O R A N D U M

December 24, 1985

TO: Art Johnson

FROM: Dick Huntamer, Chemist *DH*

SUBJECT: Organic Analyses of Pasco  
Industrial Park Samples,  
Pasco, Washington

Twelve samples, collected on September 9-10, 1985, were received at the Manchester Environmental Laboratory on September 11, 1985, for analyses. The results of the acid/base-neutral analyses on the water and tissue samples are attached. The three soil samples had to be re-extracted due to poor surrogate recoveries.

The results of the analyses are attached.

Lab Number

378086	Manhole # 2	Water
378087	Well # 1	Water
378088	Ind. Park Drain O/W Separator	Water
378089	" Replicate "	Water
378090	West Drain to Juvenile Pond	Water
378091	Pond Discharge to Columbia River	Water
378092	Transfer Blank	Water
378093	Transport Blank	Water
378094	Juvenile Pond East End	Soil
378095	Juvenile Pond East End	Soil
378096	Juvenile Pond West End	Soil
378097	Juvenile Pond	Fish Tissue
378098	Well # 1	

DH/cm  
Attachment

ACID/BASE/NEUTRAL COMPOUNDS

PROJECT Pasco Industrial Park  
 LABORATORY Manchester

COMPILED BY: JMBlayrich  
 REVIEWED BY: CFZ

DATE: 12-24-85  
 DATE: 12-24-85

SAMPLE # :	378086	378087	378088	378089	378090	378091	378092	378093	378097
UNITS :	ug/l	—	—	—	—	—	—	—	ug/Kg*
% SOLIDS :	—	—	—	—	—	—	—	—	—
Date Extracted/Date Analyzed	<u>10-10-85</u> <u>11-27-85</u>	<u>11-10-85</u> <u>11-27-85</u>	<u>10-11-85</u> <u>11-26-85</u>	<u>10-10-85</u> <u>12-2-85</u>	<u>10-10-85</u> <u>11-26-85</u>	<u>10-10-85</u> <u>11-26-85</u>	<u>10-10-85</u> <u>11-26-85</u>	<u>10-10-85</u> <u>11-26-85</u>	<u>10-23-85</u> <u>12-2-85</u>
1. N-Nitrosodimethylamine	—	—	—	—	—	—	—	—	—
2. Aniline	—	—	—	—	—	—	—	—	—
3. Phenol	2M	3000M	2M	2M	2M	2M	2M	2M	400M
4. bis(2-Chloroethyl) ether									
5. 2-Chlorophenol									
6. 1,3-Dichlorobenzene									
7. 1,4-Dichlorobenzene									
8. 1,2-Dichlorobenzene									
9. Benzyl Alcohol									
10. 2-Methylphenol									
11. bis (2-Chloroisopropyl) ether									
12. Hexachloroethane									
13. 4-Methylphenol									
14. N-Nitroso-di-n-Propylamine									
15. Nitrobenzene									
16. Isophorone									
17. 2-Nitrophenol									
18. 2,4-Dimethylphenol									
19. bis(-2-Chloroethoxy) methane	∨	∨	∨	∨	∨	∨	∨	∨	∨

\* = wet weight basis



ACID/BASE/NEUTRAL COMPOUNDS

PROJECT Pasco Industrial Park  
 LABORATORY Manchester

COMPILED: Jm Blaylock  
 REVIEWED BY: DBH

DATE: 12-24-85  
 DATE: 12-24-85

SAMPLE # :	378086	378087	378088	378089	378090	378091	378092	378093	378097
UNITS :	ug/l								ug/kg
40. 2,4-Dinitrotoluene	2M	3000M	2M	2M	2M	2M	2M	2M	400M
41. Fluorene									
42. Diethyl phthalate									
43. N-Nitrosodiphenylamine (1)									
44. 4-Chlorophenyl phenyl ether									
45. 4,6 Dinitro-2-methylphenol									
46. 4-Bromophenyl phenyl ether									
47. Hexachlorobenzene									
48. Pentachlorophenol									
49. Phenanthrene		(1500M)							
50. Anthracene		3000M							
51. Di-n-Butyl phthalate									
52. Fluoranthene	∨	∨	∨	∨	∨	∨	∨	∨	∨
53. Benzidine	-	-	-	-	-	-	-	-	-
54. Pyrene	2M	3000M	2M	2M	2M	2M	2M	2M	400M
55. Butyl benzyl phthalate									
56. Benzo(a)anthracene									
57. 3,3'-Dichlorobenzidine									
58. Chrysene					∨	∨	∨	∨	∨
59. bis(2-Ethylhexyl)phthalate	∨	∨	∨	∨	8BM	16BM	3BM	4BM	13,000BM

ACID/BASE/NEUTRAL COMPOUNDS

PROJECT Pasco Industrial Park  
 LABORATORY Manchester

COMPILED BY: JM Blazewich  
 REVIEWED BY: OOD

DATE: 12-24-85  
 DATE: 12-24-85

SAMPLE # :	378086	378087	378088	378089	378090	378091	378092	378093	378097
UNITS :	mg/l	→							mg/kg
60. Di-n-octyl phthalate	2u	3000u	2u	2u	2u	2u	2u	2u	400u
61. Benzo(b)fluoranthene	↓	↓	↓	↓	↓	↓	↓	↓	↓
62. Benzo(k)fluoranthene	↓	↓	↓	↓	↓	↓	↓	↓	↓
63. Benzo(a)pyrene	↓	↓	↓	↓	↓	↓	↓	↓	↓
64. Indeno(1,2,3-cd)pyrene	↓	↓	↓	↓	↓	↓	↓	↓	↓
65. Dibenz(a,h)anthracene	↓	↓	↓	↓	↓	↓	↓	↓	↓
66. Benzo(g,h,i)perylene	↓	↓	↓	↓	↓	↓	↓	↓	↓

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration dilution actions (This is not necessarily the instrument detection limit). The footnotes should read U: Compound was analyzed for for but not detected. The number is the minimum attainable detection limit for the sample.

J Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. (e.g. 10J)

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.



ANDREA BEATTY RINIKER  
Director



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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M E M O R A N D U M  
February 21, 1986

TO: Art Johnson

FROM: Dick Huntamer, Chemist *DH*

SUBJECT: Organic Analyses of Pasco Industrial  
Park Samples, Pasco, Washington

Twelve samples, collected on September 9-10, 1985, were received at the Manchester Environmental Laboratory on September 11, 1985, for analyses. The results of the volatile organic analyses on the three soil samples which had to be re-extracted due to poor surrogate recoveries are attached.

Lab Number

378086	Manhole # 2	Water
378087	Well # 1	Water
378088	Ind. Park Drain O/W Separator	Water
378089	Ind. Park Replicate	Water
378090	West Drain to Juvenile Pond	Water
378091	Pond Discharge to Columbia River	Water
378092	Transfer Blank	Water
378093	Transport Blank	Water
378094	Juvenile Pond East End	Soil
378095	Juvenile Pond East End	Soil
378096	Juvenile Pond West End	Soil
379097	Juvenile Pond	Fish Tissue
378098	Well # 1	

DH/cm  
Attachment

VOLATILES

PROJECT CODE WDOE-412

PROJECT Pasco Indust. Park

COMPILED BY: SV Pope

DATE: 2-20-86

LABORATORY Manchester Lab

REVIEWED BY: H Smith

DATE: 2-20-86

SAMPLE # :	37-8094	37-8095	37-8096						
UNITS :	ug/kg	————→	————→						
% SOLIDS :	35.2	31.5	29.0						
Date Analyzed :	1-16-86	————→	————→						
1. chloromethane	70u	76u	86u						
2. bromomethane	↓	↓	↓						
3. vinyl chloride	↓	↓	↓						
4. chloroethane	↓	↓	↓						
5. methylene chloride	11uJ	11uJ	14uJ						
6. acetone	380uJ	170uJ	<del>160uJ</del> 13u						
7. carbon disulfide	35u	38u	43u						
8. 1,1-dichloroethene	↓	↓	↓						
9. 1,1-dichloroethane	↓	↓	↓						
10a trans-1,2-dichloroethene	↓	↓	↓						
10b cis-1,2-dichloroethene	↓	↓	↓						
11. chloroform	↓	↓	↓						
12. 1,2-dichloroethane	↓	↓	↓						
13. 2-butanone	188uJ	130uJ	96uJ						
14. 1,1,1-trichloroethane	35u	38u	43u						
15. carbon tetrachloride	↓	↓	↓						
16. vinyl acetate	70u	76u	86u						
17. bromodichloromethane	35u	38u	43u						
18. 1,1,2,2-tetrachloroethane	↓	↓	↓						
19. 1,2-dichloropropane	↓	↓	↓						
20. trans-1,3-dichloropropene	↓	↓	↓						

## VOLATILES (Continued)

PROJECT Pasco Indust. ParkCOMPILED BY: S. V. IgeDATE: 2-20-86LABORATORY Manchester LabREVIEWED BY: J. T. H.DATE: 2-20-86

SAMPLE # :	37- 6094	37- 6095	37- 6096						
UNITS :	ug/kg	—	—						
21. trichloroethene	35u	44UJ	3uJ						
22. dibromochloromethane		38u	43u						
23. 1,1,2-trichloroethane									
24. benzene									
25. cis-1,3-dichloropropene	↓	↓	↓						
26. 2-chloroethylvinyl ether	70u	70u	80u						
27. bromoform	35u	38u	43u						
28. 2-hexanone	70u	100	80u						
29. 4-methyl-2-pentanone	↓	59	↓						
30. tetrachloroethene	35u	38u	5.7J						
31. toluene	1J		43u						
32. chlorobenzene	35u								
33. ethylbenzene									
34. styrene	↓								
35. total xylenes	5J	↓	↓						

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration dilution actions (This is not necessarily the instrument detection limit). The footnotes should read U: Compound was analyzed for for but not detected. The number is the minimum attainable detection limit for the sample.

J Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. (e.g. 10J)

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.



ANDREA BLATTY RINDELL  
Director



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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M E M O R A N D U M

March 26, 1986

TO: Art Johnson

FROM: Dick Huntamer, Chemist *DH*

SUBJECT: Organic Analyses of Pasco Industrial  
Park Soil Samples, Pasco, Washington

Three soil samples, collected on September 9-10, 1985, were received at the Manchester Environmental Laboratory on September 11, 1985; re-extracted January 3, 1986 and analyzed February 5-7, 1986 for acid base-neutral organic analysis. Since the work on these samples was cancelled due to holding times, this data is provided for your information.

The results of the analyses are attached.

Lab Number

378094	Juvenile Pond East End
378095	Juvenile Pond East End Replicate
378096	Juvenile Pond West End

Attachment  
DH/cm

ACID/BASE/NEUTRAL COMPOUNDS

PROJECT Rose-Lind Park  
 LABORATORY Manchester

COMPILED BY: JM Blazewich  
 REVIEWED BY: DOH

DATE: 3-23-86  
 DATE: 3-24-86

SAMPLE # :	378094	378095	378096						
UNITS :	mg/kg	→							
% SOLIDS :	35.2	31.5	29.0						
Date Extracted/Date Analyzed	<u>1-3-86</u> <u>2-5-86</u>	<u>1-3-86</u> <u>2-7-86</u>	<u>2-3-86</u> <u>2-5-86</u>						
1. N-Nitrosodimethylamine	—	—	—						
2. Aniline	—	—	—						
3. Phenol	1400u	1400u	1600u						
4. bis(2-Chloroethyl) ether	↓	↓	↓						
5. 2-Chlorophenol	↓	↓	↓						
6. 1,3-Dichlorobenzene	↓	↓	↓						
7. 1,4-Dichlorobenzene	↓	↓	↓						
8. 1,2-Dichlorobenzene	↓	↓	↓						
9. Benzyl Alcohol	↓	↓	↓						
10. 2-Methylphenol	↓	↓	↓						
11. bis (2-Chloroisopropyl) ether	↓	↓	↓						
12. Hexachloroethane	↓	↓	↓						
13. 4-Methylphenol	↓	↓	↓						
14. N-Nitroso-di-n-Propylamine	↓	↓	↓						
15. Nitrobenzene	↓	↓	↓						
16. Isophorone	↓	↓	↓						
17. 2-Nitrophenol	↓	↓	↓						
18. 2,4-Dimethylphenol	↓	↓	↓						
19. bis(-2-Chloroethoxy) methane	↓	↓	↓						

ACID/BASE/NEUTRAL COMPOUNDS

PROJECT Powderland Park  
 LABORATORY Manchester

COMPILED BY: JM Blazewich  
 REVIEWED BY: Deff

DATE: 3-23-86  
 DATE: 3-24-86

SAMPLE # :	378094	378095	378096						
UNITS :	ug/Kg →								
20. 2,4-Dichlorophenol	1400u	1400u	1600u						
21. 1,2,4-Trichlorobenzene									
22. Benzoic Acid									
23. Naphthalene									
24. 4-Chloroaniline									
25. Hexachlorobutadiene									
26. 4-Chloro-3-methylphenol									
27. 2-Methylnaphthalene									
28. Hexachlorocyclopentadiene									
29. 2,4,6-Trichlorophenol									
30. 2,4,5-Trichlorophenol									
31. 2-Chloronaphthalene									
32. 3-Nitroaniline									
33. Acenaphthylene									
34. Dimethyl phthalate									
35. 2,6-Dinitrotoluene									
36. Acenaphthene									
37. 2,4-Dinitrophenol									
38. Dibenzofuran									
39. 4-Nitrophenol	↓	↓	↓						

ACID/BASE/NEUTRAL COMPOUNDS

PROJECT Pasco Lind Park  
 LABORATORY Manchester

COMPILED: JM Blaznich  
 REVIEWED BY: BOJ

DATE: 3-23-86  
 DATE: 3-24-86

SAMPLE # :	378094	378095	378096						
UNITS :	ug/Kg	→							
40. 2,4-Dinitrotoluene	1400u	1400u	1600u						
41. Fluorene	↓	↓	↓						
42. Diethyl phthalate	↓	↓	↓						
43. N-Nitrosodiphenylamine (1)	↓	↓	↓						
44. 4-Chlorophenyl phenyl ether	↓	↓	↓						
45. 4,6 Dinitro-2-methylphenol	↓	↓	↓						
46. 4-Bromophenyl phenyl ether	↓	↓	↓						
47. Hexachlorobenzene	↓	↓	↓						
48. Pentachlorophenol	↓	↓	860J 1600u						
49. Phenanthrene	↓	↓	↓						
50. Anthracene	↓	↓	↓						
51. Di-n-Butyl phthalate	↓	↓	↓						
52. Fluoranthene	↓	↓	↓						
53. Benzidine	—	—	—						
54. Pyrene	1400u	1400u	1600u						
55. Butyl benzyl phthalate	1700u	↓	↓						
56. Benzo(a)anthracene	1400u	↓	↓						
57. 3,3'-Dichlorobenzidine	↓	↓	↓						
58. Chrysene	↓	↓	↓						
59. bis(2-Ethylhexyl)phthalate	2700u	↓	1300u						

ACID/BASE/NEUTRAL COMPOUNDS

PROJECT Pasco Lind Park  
 LABORATORY Manchester

COMPILED BY: JM Blazynich  
 REVIEWED BY: oot

DATE: 2-23-86  
 DATE: 3-24-86

SAMPLE # :	378094	378095	378096						
UNITS :	ug/Kg	→	→						
60. Di-n-octyl phthalate	1400u	1400u	1600u						
61. Benzo(b)fluoranthene	↓	↓	↓						
62. Benso(k)fluoranthene	↓	↓	↓						
63. Benzo(a)pyrene	↓	↓	↓						
64. Indeno(1,2,3-cd)pyrene	↓	↓	↓						
65. Dibenz(a,h)anthracene	↓	↓	↓						
66. Benzo(g,h,i)perylene	↓	↓	↓						

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration dilution actions (This is not necessarily the instrument detection limit). The footnotes should read U: Compound was analyzed for for but not detected. The number is the minimum attainable detection limit for the sample.

J Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. (e.g. 10J)

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.



ANDREA BEATTY RINKER  
Director



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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M E M O R A N D U M

March 31, 1986

TO: Art Johnson  
FROM: Bob Carrell, Chemist   
SUBJECT: Pasco Industrial Park  
Pesticides and PCB's

Eleven samples, collected on September 9-11, 1985, were received at the Manchester Environmental Laboratory on September 12, 1985 for pesticides and PCB's analyses. None of the samples displayed pesticides or PCB's at or above the detection limits of the test.

The results of the analyses are attached.

Lab Number

378086	Industrial Park drain at manhole #1
378087	Well Number 1
378088	Industrial Park drain at O/W separator
378089	Industrial Park drain at O/W separator (replicate)
378090	West drain to "Juvenile Pond"
378091	Pond discharge to Columbia River
378092	Transfer blank
378093	Transport blank
378094	"Juvenile Pond" east end
378095	"Juvenile Pond" east end (replicate)
378096	"Juvenile Pond" west end

BC/cm

Attachment

Pasco Industrial Park

	378086	378087	378088	378089	378090	378091	378092	378093	378094	378095	378096	Blank
	ug/L											
aldrin	.002u	0.10u	.002u	.002u	.002u	.002u	.002u	.002u	5u	5u	5u	ND
dieldrin	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
chlordane	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
4,4'-DDT	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
4,4'-DDE	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
4,4'-DDD	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
endosulfan I	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
endosulfan II	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
endosulfan sulfate	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
endrin	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
endrin aldehyde	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
heptachlor	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
heptachlor epoxide	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
BHC A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
BHC B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Lindane	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
BHC D	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
PCB 1242	.040u	2.5u	.040u	.040u	.040u	.040u	.040u	60u	60u	60u	60u	
PCB 1254	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
PCB 1221	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
PCB 1232	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
PCB 1248	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
PCB 1260	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
PCB 1016	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
toxaphene	0.12u	7.5u	.12u	0.12u	.12u	.12u	.12u	.12u	180u	180u	180u	
O,P,DDE I.S. %	99	--	91	95	101	110	111	114	119	112	109	



ENVIRONMENTAL LABORATORY  
DATA SUMMARY  
METALS

A. Johnson

SOURCE Pasco Industrial Park

PROGRAM NUMBER 412

DATE COLLECTED 9-9, 11-85

RECEIVED 9-11-85

COLLECTED BY A. Johnson

Sample (Log) Number	Units	Standard Deviation ± %	378086	378087	378088	378089	378090	378091	378093
Station:			Manhole #2	Well #1	O-W Separat.	Rep.	West Drain	Pond Discharge	Transport Blank
(Cu)	µg/L		68	68	66	60	68	45	5
(Zn)	µg/L		21	6	50	47	11	15	14
Fe									
(Ni)	µg/L		24	5	38	<1	30	10	33
(Cr)	µg/L		<1	<1	<1	15	<1	<1	<1
(Cd)	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
(Pb)	µg/L		13	246	<1	<1	<1	6	<1
Mn									

NOTE: Dissolved Metals: Those that will pass through a 0.45 µ membrane filter  
Suspended Metals: Those retained by a 0.45 µ membrane filter  
Total Metals: Those found in the unfiltered, rigorously acid digested sample  
mg/L = ppm = µg/ml  
µg/L = ppb = ng/ml

mg/kg = ppm - µg/gm  
µg/kg = ppb = ng/gm  
" < " is "less than" and " > " is "greater than"

SUMMARIZED BY [Signature] DATE 3-5-86

REVIEWED BY [Signature] DATE 3/6/86



ENVIRONMENTAL LABORATORY  
DATA SUMMARY  
METALS

SOURCE Pasco Industrial Park PROGRAM NUMBER 412  
DATE COLLECTED 9-9-85 RECEIVED 9-11-85 COLLECTED BY A. Johnson

Sample (Log) Number	Units	Standard Deviation ± %	37 8087 Duplicate	PB 37.11 Procedure Blank	PB 37.12 Procedure Blank				
(Cu)	µg/L		47	<1	<1				
(Zn)	µg/L		4	<1	6				
Fe									
(Ni)	µg/L		6	<1	<1				
(Cr)	µg/L		<1	<1	<1				
(Cd)	µg/L		<0.1	<0.1	<0.1				
(Pb)	µg/L		255	<1	<1				
Mn									

NOTE: Dissolved Metals: Those that will pass through a 0.45 µ membrane filter  
Suspended Metals: Those retained by a 0.45 µ membrane filter  
Total Metals: Those found in the unfiltered, rigorously acid digested sample  
mg/L = ppm = µg/ml      mg/kg = ppm - µg/gm      "<" is "less than" and ">" is "greater than"  
µg/L = ppb = ng/ml      µg/kg = ppb = ng/gm

SUMMARIZED BY R. J. [Signature] DATE 3-5-86  
REVIEWED BY Sam Conroy DATE 3/6/86



ENVIRONMENTAL LABORATORY  
DATA SUMMARY  
METALS

A. Johnson

SOURCE Pasco Industrial Park PROGRAM NUMBER 412

DATE COLLECTED 9-9, 11-85 RECEIVED 9-11-85 COLLECTED BY A. Johnson

Sample (Log) Number	Units	Standard Deviation ± %	378086	378087	378088	378089	378090	378091	378093		
Station:			Manhole #2	Well #1	G-W Separat.	Rep.	West Drain	Pond Discharge	Transport Blank		
(Hg)	µg/L		<0.05	0.90	<0.05	<0.05	<0.05	0.05	<0.05		
(As)	µg/L		4	107	8	2	8	8	<1		
Se											
Ba											
Ag											
Na											
K											
Ca											

NOTE: Dissolved Metals: Those that will pass through a 0.45 µ membrane filter  
Suspended Metals: Those retained by a 0.45 µ membrane filter  
Total Metals: Those found in the unfiltered, rigorously acid digested sample

mg/L = ppm = µg/ml  
mg/kg = ppm = µg/gm  
µg/L = ppb = ng/ml  
µg/kg = ppb = ng/gm

"<" is "less than" and ">" is "greater than"

SUMMARIZED BY R. J. L. L. L. DATE 9-5-86

REVIEWED BY Pam Conroy DATE 3/6/86



ENVIRONMENTAL LABORATORY  
DATA SUMMARY  
METALS

ORIGINAL TO: LAB FILES

COPIES TO:

A. Johnson

SOURCE Pasco Industrial Park PROGRAM NUMBER 412

DATE COLLECTED 9-9, 11-85 RECEIVED 9-11-85 COLLECTED BY A. Johnson

Sample (Log) Number	Units	Standard Deviation ± %	378087	PB37.11	PB37.12					
Station:			Duplicate	Procedure Blank	Procedure Blank					
Hg										
As	µg/L		108	<1	<1					
Se										
Ba										
Ag										
Na										
K										
Ca										

NOTE: Dissolved Metals: Those that will pass through a 0.45 µ membrane filter  
 Suspended Metals: Those retained by a 0.45 µ membrane filter  
 Total Metals: Those found in the unfiltered, rigorously acid digested sample  
 mg/L = ppm = µg/ml  
 mg/kg = ppm = µg/gm  
 µg/L = ppb = ng/ml  
 µg/kg = ppb = ng/gm

"<" is "less than" and ">" is "greater than"

SUMMARIZED BY R. Arata DATE 3-5-86  
 REVIEWED BY Pam Carey DATE 3/6/86



ENVIRONMENTAL LABORATORY  
DATA SUMMARY  
METALS

SOURCE Pasco Industrial Park

PROGRAM NUMBER 412

DATE COLLECTED 9-11-85 RECEIVED 9-11-85

COLLECTED BY A. Johnson, D. Norton

Sample (Log) Number	Units	Standard Deviation ± %	37 8097	37 8097	37 8097				
Station:			Juvenile Pond	Duplicate	Spike	% recovery			
Cu									
Zn									
Fe									
Ni									
Cr									
(Cd)	µg/gm	<0.003	<0.003						
(Pb)	µg/gm	.162	.139						
Mn									
(Hg) wet wt	µg/gm	0.038	0.039			57.4%			

NOTE: Dissolved Metals: Those that will pass through a 0.45 µ membrane filter  
Suspended Metals: Those retained by a 0.45 µ membrane filter  
Total Metals: Those found in the unfiltered, rigorously acid digested sample  
mg/L = ppm = µg/ml      mg/kg = ppm = µg/gm  
µg/L = ppb = ng/ml      µg/kg = ppb = ng/gm

"<" is "less than" and ">" is "greater than"

SUMMARIZED BY R. [Signature] DATE 3-5-86  
REVIEWED BY Pam [Signature] DATE 3/6/86



ENVIRONMENTAL LABORATORY  
DATA SUMMARY  
METALS

SOURCE Pasco Industrial Park

PROGRAM NUMBER 412

DATE COLLECTED 9-11-85 RECEIVED 9-11-85 COLLECTED BY A. Johnson, P. Norton

Sample (Log) Number	Units	Standard Deviation ± %	378094	378095	378096	378096				
Station:						Duplicate				
(Cu) Dry wt	µg/gm		*	*	89.4	91.2				
(Zn) Dry wt	µg/gm		*	*	88.3	88.6				
Fe										
Ni										
(Cr) Dry wt	µg/gm		*	*	28.0	27.9				
(Cd) Dry wt	µg/gm		*	*	0.19	0.21				
(Pb) Dry wt	µg/gm		*	*	50.4	50.2				
Mn										
(As) Dry wt	µg/gm		*	*	4.1	12.1				
(Hg) Wet wt	µg/gm		*	*	0.008	0.006				

2/5 Solid

40.4%

\* = Sample lost by Lab

NOTE: Dissolved Metals: Those that will pass through a 0.45 µ membrane filter  
Suspended Metals: Those retained by a 0.45 µ membrane filter  
Total Metals: Those found in the unfiltered, rigorously acid digested sample  
mg/L = ppm = µg/ml  
µg/L = ppb = ng/ml

SUMMARIZED BY R. L. ... DATE 3-5-86  
REVIEWED BY Pam Corley DATE 3/6/86

"<" is "less than" and ">" is "greater than"



DATA SUMMARY

ORIGINAL TO: LAB FILES

COPIES TO: Art Johnson

SOURCE Pasco Industrial Park

DATE COLLECTED 9/9-10/85

COLLECTED BY AS/DN

Sample (Log) Number	37	8095	8096	8097	8098						
Station:		Rep E. End	W. End Jur. Pond	Jur. Pond	Well						
pH (units)											
Turbidity (NTU)											
Sp. Conductivity (umhos/cm)											
COD											
BOD (5 day)											
Fecal Coliform (Col./100 ml)											
NO3-N											
NO2-N											
NH3-N											
T. Kjeldahl-N											
O-P04-P											
Total Phos.-P											
Total Solids - %		31	29	22							
Total Non Vol. Solids % ash		93	91								
Total Suspended Solids											
Total Non Vol. Sus. Solids											
Recoverable Oil & Grease		0.2 %	0.2 %								
% Lipids				1.6							

NOTE: All results are in mg/L (ppm) unless otherwise specified. ND is "None Detected"  
 "<" is "Less Than" and ">" is "Greater Than"

SUMMARIZED BY Gam Currey DATE 10/29/85  
 REVIEWED BY R. D. Thomas DATE 1/6/86

ANGIEA BEATTY RINKER  
Director



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

M E M O R A N D U M

February 6, 1986

TO: Art Johnson  
FROM: Bob Carrell, Chemist *BC*  
SUBJECT: Pasco Industrial Park Sample #85-378086  
Through 88, 85-378090, 91 and 98

These water samples were collected on September 10, 1985 and delivered to the Manchester Laboratory on September 11, 1985 with the request for hydrocarbon matching analyses.

Samples 85-378086, 88, 90 and 91 did not display contamination from hydrocarbons and were essentially clean. However, samples #85-378087 and 98 indicated contamination from a wide boiling range hydrocarbon mix. It would appear that this hydrocarbon mixture is associated with gasoline as well as a heavier fraction such as stove oil.

Due to the component similarity of stove oil, #1 diesel oil, kerosene, and some jet fuel types, i.e. JP-5 and JET-A, it is not possible to identify which hydrocarbon mixture these are without samples from possible contaminating sources.

Should you have any question regarding this please call.

Lab Number

378086	Manhole #2	Water
378087	Well #1	Water
378088	Ind. Park Drain O/W Separator	Water
378090	West Drain to Juvenile Pond	Water
378091	Pond Discharge to Columbia River	Water
378098	Well #1	

BC/cm



PESTICIDES (continued)

PROJECT: PASSO INDUSTRIAL PARK COMPILED BY: BOB RIECK DATE: MAY 28, 1986

LABORATORY: MANCHESTER REVIEWED BY: BOB CARRELL DATE: MAY 29, 1986

SAMPLE #:	BA6098 T	BA6098 TS	378097 Y	378097 YS	378097								
UNITS :	mg/kg					→							
LOQ :	BLANK	BLANK	MATRIX	MATRIX	SAMPLE								
19. PCB 1016	ND	ND	NOT SPIKED		30u								
20. PCB 1221	↓	↓	↓	↓	↓								
21. PCB 1232	↓	↓	↓	↓	↓								
22. PCB-1242	↓	↓	↓	↓	↓								
23. PCB-1248	↓	↓	↓	↓	↓								
24. PCB- <del>1260</del> 1254	↓	↓	↓	↓	300								
25. PCB 1260	↓	↓	↓	↓	30u								
26. Methoxychlor	↓	↓	↓	↓	—								
O, P DDE, I. S.	80%	89%	103%	118%	INTERFERENCE								

BC/cm

3-31-86